In the Claims

Please amend the claims as follows:

1. (Currently amended) A method, comprising:

identifying a <u>longest</u> chain of zero bytes in an uncompressed IPv6 address, the chain of zero bytes having a chain length and a chain location,

generating a compressed IPv6 address corresponding to the uncompressed IPv6 address by removing the chain of zero bytes from the uncompressed IPv6 address and providing compression information for the compressed IPv6 address, the compression information corresponding to the chain length and the chain location.

2. (Original) The method of claim 1, wherein the compression information is a single byte containing the chain length and the chain location.

3. (Original) The method of claim 1, wherein the compression information is a single byte containing the chain location and a length of the compressed IPv6 address.

4. (Original) The method of claim 2, wherein the single byte is the most significant byte of the compressed IPv6 address.

5. (Original) The method of claim 1, wherein the compression information is included in the compressed IPv6 address.

6. (Currently amended) A method, comprising:

identifying compression information of a compressed IPv6 address, the compression information corresponding to a chain length and a chain location of a chain of zero bytes removed from an uncompressed IPv6 address corresponding to the compressed IPv6 address,

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generating the uncompressed IPv6 address by adding the chain of zero bytes having the chain length to the compressed IPv6 address at the chain location and eliminating the compression information,

wherein the compressed IPv6 address is compressed by removing a longest chain of zero bytes from the uncompressed IPv6 address.

7. (Original) A method, comprising

determining a chain location and chain length of a chain of zero bytes removed from a compressed IPv6 address based on compression information of the compressed IPv6 address, the compressed IPv6 address having a number of pre-chain location bytes and a number of post-chain location bytes;

comparing pre-chain location bytes of the compressed IPv6 address to corresponding bytes of the uncompressed IPv6 address, and reporting a result when at least one pair of such pre-chain corresponding bytes is different;

when no result is reported, comparing bytes of the uncompressed IPv6 address corresponding to the chain of zero bytes, and reporting the result when at least one of the bytes of the uncompressed IPv6 address corresponding to the chain of zero bytes is non-zero;

when no result is reported, comparing post-chain location bytes of the compressed IPv6 address to corresponding bytes of the uncompressed IPv6 address, and reporting the result.

8. (Original) The method of claim 7, wherein the result is one of:

the uncompressed IPv6 address is larger than the compressed IPv6 address;

the uncompressed IPv6 address is smaller than the compressed IPv6 address; and

the uncompressed IPv6 address is equal to the compressed IPv6 address.

9. (Original) The method of claim 7, wherein each comparison includes applying a mask associated with at least one of the uncompressed IPv6 address and compressed IPv6 address, the mask determining whether comparison of further bytes is performed.

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10. (Original) The method of claim 7, wherein the comparison steps are performed one byte at a time, and upon reporting the result, no further comparisons take place.

11. (Original) The method of claim 7, wherein the number of pre-chain location bytes is zero.

12. (Original) A method, comprising

determining a first chain location and first chain length of a first chain of zero bytes removed from a first compressed IPv6 address based on compression information of the first compressed IPv6 address, the first compressed IPv6 address having a first number of bytes, including a first number of pre-chain location bytes and a first number of post-chain location bytes;

determining a second chain location and second chain length of a second chain of zero bytes removed from a second compressed IPv6 address based on compression information of the second compressed IPv6 address, the second compressed IPv6 address having a second number of bytes, including a second number of pre-chain location bytes and a second number of post-chain location bytes;

comparing the compression information of the first compressed IPv6 address to the compression information of the second compressed IPv6 address;

when the compression information of the first compressed IPv6 address and the compression information of the second compressed IPv6 address are equal, comparing the first number of bytes to corresponding ones of the second number of bytes, and producing a result;

when the compression information of the first compressed IPv6 address and the compression information of the second compressed IPv6 address are not equal—

comparing the first pre-chain location bytes to corresponding ones of the second pre-chain location bytes, and producing the result when at least one pair of such pre-chain corresponding bytes is different;

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when no result is produced, comparing the first chain location to the second chain location, and producing the result when the first chain location and the second chain location are not equal;

when no result is produced, comparing the first chain length to the second chain length, and producing the result.

13. (Original) The method of claim 12, wherein the result is one of:

the first compressed IPv6 address is larger than the second compressed IPv6 address;

the first compressed IPv6 address is smaller than the second compressed IPv6 address; and

the first compressed IPv6 address is equal to the second compressed IPv6 address.

14. (Original) The method of claim 12, wherein the comparison steps are performed one byte at a time, and upon producing the result, no further comparisons take place.

15. (Original) The method of claim 12, wherein at least one of the first number of pre-chain location bytes and second pre-chain location bytes is zero.

16. (Currently amended) A method, comprising

receiving an OSPF message containing an LSA having an uncompressed IPv6 address;

compressing the uncompressed IPv6 address into a corresponding compressed IPv6 address;

storing the LSA in a link state database, the LSA containing the compressed IPv6 address,

wherein the compressing is preformed by·

identifying a longest chain of zero bytes in the uncompressed IPv6 address, the chain of zero bytes having a chain length and a chain location, and

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generating the corresponding compressed IPv6 address by removing the chain of
zero bytes from the uncompressed IPv6 address and providing compression information
for the compressed IPv6 address, the compression information corresponding to the chain
length and the chain location.

17. (Canceled)

18. (Original) The method of claim 16, further comprising:

creating an OSPF routing table based on the link state database, the OSPF routing table
including the compressed IPv6 address.

19. (Currently amended) A method, comprising:

receiving a message containing an IPv6 destination address;

comparing the IPv6 destination address to a compressed IPv6 address stored in a routing
table, and when the IPv6 destination address matches the compressed IPv6 address, retrieving
forwarding information corresponding to the compressed IPv6 address;

forwarding the message according to the forwarding information,

wherein the compressed IPv6 address is compressed by removal of a longest chain of
zero bytes from an uncompressed version of the compressed IPv6 address.

20. (Original) The method of claim 19, wherein the comparing is performed by

determining a chain location and chain length of a chain of zero bytes removed from the
compressed IPv6 address based on compression information of the compressed IPv6 address, the
compressed IPv6 address having a number of pre-chain location bytes and a number of post-
chain location bytes;

comparing pre-chain location bytes of the compressed IPv6 address to corresponding
bytes of the IPv6 destination address, and reporting no match when at least one pair of such pre-
chain corresponding bytes is different;

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when no match is reported, comparing bytes of the IPv6 destination address corresponding to the chain of zero bytes, and reporting no match when at least one of the bytes of the IPv6 destination address corresponding to the chain of zero bytes is non-zero;

when no match is reported, comparing post-chain location bytes of the compressed IPv6 address to corresponding bytes of the IPv6 destination address, reporting no match when at least one pair of such post-chain corresponding bytes is different, and reporting a match when no pair of such post-chain corresponding bytes is different.

21. (Original) The method of claim 20, further comprising

retrieving a mask associated with the compressed IPv6 address;

for each byte comparison, applying the mask to determine whether further comparison is performed;

when further comparison is not performed based on application of the mask, reporting a match.

22. (Original) The method of claim 19, wherein the comparing includes:

comparing the IPv6 destination address to a plurality of compressed IPv6 addresses stored in the routing table, each of the plurality of compressed IPv6 addresses having corresponding forwarding information;

when the IPv6 destination address matches a current one of the plurality of compressed IPv6 addresses, comparing the current one of the plurality of compressed IPv6 addresses to a stored best fit address;

setting the current one of the plurality of compressed IPv6 addresses as the stored best fit address when the current one of the plurality of compressed IPv6 addresses is more specific that the stored best fit address;

retrieving forwarding information corresponding to the stored best fit address when comparisons of the IPv6 destination address to the plurality of compressed IPv6 addresses are completed.

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23. (Original) The method of claim 20, wherein the number of pre-chain location bytes is zero.

24. (Currently amended) A computer readable medium, comprising:

a set of instructions to a processing system, the set of instructions configured to control the processing system to perform the steps of--receiving a message containing an IPv6 destination address;

comparing the IPv6 destination address to a compressed IPv6 address stored in a routing table, and when the IPv6 destination address matches the compressed IPv6 address, retrieving forwarding information corresponding to the compressed IPv6 address;

forwarding the message according to the forwarding information,

wherein the compressed IPv6 address is compressed by removal of a longest chain of zero bytes from an uncompressed version of the compressed IPv6 address.

25. (Currently amended) A computer readable medium, comprising:

a set of instructions to a processing system, the set of instructions configured to control the processing system to perform the steps of—

receiving an OSPF message containing an LSA having an uncompressed IPv6 address;

compressing the uncompressed IPv6 address into a corresponding compressed IPv6 address;

storing the LSA in a link state database, the LSA containing the compressed IPv6 address,

wherein the compressing is performed by

identifying a longest chain of zero bytes in the uncompressed IPv6 address, the chain of zero bytes having a chain length and a chain location, and

generating the corresponding compressed IPv6 address by removing the chain of zero bytes from the uncompressed IPv6 address and providing compression information

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for the compressed IPv6 address, the compression information corresponding to the chain length and the chain location.

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